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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/750,169

12/31/2003

John S. Sadowsky

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5037

21186 7590 03/21/2007

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EXAMINER

AHN, SAM K

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/750,169		SADOWSKY, JOHN S.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Sam K. Ahn		2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-18 and 23-30 is/are allowed.
- 6) ☒ Claim(s) 1-13 and 19-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>062705</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. The elements in Fig.1 need to have descriptive label, in conformance with 37 CFR 1.84(n) and 1.84(o). For example, a descriptive label of "MIMO device" should be inserted into 102 in Fig.1 to properly describe the element.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-13 and 19-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claims 1-13 and 19-22, the compliance of the claimed invention with the subject matter eligibility requirement of 35 U.S.C. 101 has been determined by the following analysis.

The claimed invention does fall within an enumerated statutory category claiming a method or a process. The claimed invention also fall with a 101 judicial exception claiming an algorithm or an abstract idea of performing certain calculations, and the claimed invention covers a 101 judicial exception or practical application of the judicial exception.

However, treating the claim as a whole, the claim does not have any practical application by physical transformation, and further, does not produce a useful, tangible and concrete result. The claimed "produces a next identified vector of

elementary modulation symbols" does not constitute as a physical transformation or produce useful, tangible result, since claim 1 as a whole stops at performing step. It merely produces symbols and does not apply or use the symbols for any purpose as claimed. Therefore, the claim merely recites an algorithm directed to a non-statutory subject matter.

### ***Claim Objections***

3. Claims 9,10 and 19-22 are objected to because of the following informalities:

In claim 9, line 3, define the variable M.

In claim 10, line 3, define the variable T.

In claim 19, line 1, "program" should be "computer program".

Claims 20-22 directly depend on claim 19.

Appropriate correction is required.

### ***Allowable Subject Matter***

4. Claims 14-18 and 23-30 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter: present application discloses a method and apparatus of a MIMO System for determining modulation type of a received signal by determining first search and producing vectors, and performing further search based on the result of the first search. Prior art teaches the subject matter claimed, however, do not explicitly teach transforming the received signal vector to a new origin that corresponds to the

identified vector to produce a transformed, received signal vector, and further performing the next search on the transformed, received signal vector within a reduced search space that is based on the identified vector, and do not explicitly teach as defined in claim 14 of scaling of the received signal vector.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fan US 2003/0012315 A1 teaches a QAM constellation wherein the origin of the constellation comprises another origin within a quadrant of the constellation.

Brunel US 2003/0236076 A1 teaches a MIMO telecommunication system performing accelerated sphere decoding by determining vectors.

Love et al. US 2004/0052317 A1 teach hierarchical decoding on a received QAM signals.

Tong et al. US 2004/0066866 A1 teach determining a smaller portion of a constellation from a received signal.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public

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Sam K. Ahn  
Patent Examiner

3/16/07